Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

MATHEMATICS **0580/32**

Paper 32 (Core) **March 2018**

MARK SCHEME

Maximum Mark: 104

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

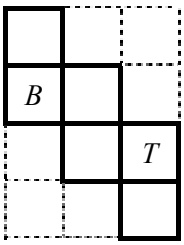
GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Abbreviations

cao correct answer only
dep dependent
FT follow through after error
isw ignore subsequent working
oe or equivalent
SC Special Case
nfww not from wrong working
soi seen or implied

Question	Answer	Marks	Partial Marks
1(a)(i)	One rectangle is an enlargement of the other oe	**1**	
1(a)(ii)	9	**2**	**M1** for 3^2 or $\frac{1}{3^2}$ or SF is 3 or $\frac{1}{3}$ or 1.5×2.5 and 4.5×7.5 or $\frac{7.5}{2.5}$ or $\frac{4.5}{1.5}$
1(b)(i)	 T in correct square	**1**	
1(b)(ii)	A different correct net drawn	**1**	
1(c)(i)	108	**3**	**M2** for $[2\times](3\times4+3\times6+4\times6)$ oe or **M1** for one of 3×4 , 3×6 , 4×6 evaluated
1(c)(ii)	72	**2**	**M1** for $3\times4\times6$
1(c)(iii)	3 positive numbers (other than 3,4,6) with product 72	**1**	**FT** *their* **(c)(ii)**
2(a)(i)	3043 3061	**2**	**B1** for each
2(a)(ii)	[Column] 7 [Row] 15	**2**	**B1** for each
2(a)(iii)	$20n + 2981$ oe	**2**	**B1** for $20n + k$
2(b)	2 [h] 5 [min]	**2**	**M1** for 100 × 1.25 oe or $1\frac{2}{3}$ ×1.25 oe or 25

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Question	Answer	Marks	Partial Marks
2(c)(i)	3	**1**	
2(c)(ii)	7	**1**	
2(c)(iii)	6.84 or 6.836 to 6.837 or $6\frac{41}{49}$	**3**	**M1** for $5\times27+6\times42+7\times63+8\times64$ **M1** dep for $\frac{their\,1340}{196}$
2(c)(iv)	$\frac{132}{196}$ oe	**2**	**M1** for 27+42+63 or 132 or $[1-]\frac{64}{196}$
3(a)(i)	5, 8, 4, 2, 6	**2**	**B1** for one error, or for two errors and total still 25 If 0 scored, **SC1** for all correct tallies if frequency column blank or incorrect
3(a)(ii)	Surfing	**1**	
3(a)(iii)	24	**1**	**FT** *their* frequency for snorkelling ×4
3(b)(i)	3.37pm cao	**1**	
3(b)(ii)	12[h]26[min]	**1**	
3(b)(iii)	12 52[pm]	**1**	
4(a)(i)	4 17 136	**3**	**B2** for two of 4, 17 or 136 in correct place or **M1** for $\frac{120}{15}$ or $\frac{72}{9}$ soi by $8^{[\circ]}$ or $120+72+32+x=360$ oe
4(a)(ii)	32° sector drawn	**1**	
4(b)	36	**1**	
5(a)(i)	Six hundred (and) four thousand, nine hundred (and) twenty five	**1**	Condone Six lakh (and) four thousand, nine hundred (and) twenty five
5(a)(ii)	53 or 59	**1**	
5(a)(iii)	1	**1**	

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Question	Answer	Marks	Partial Marks
5(b)(i)	105	**1**	
5(b)(ii)	64	**1**	
5(b)(iii)	1, 3, 5, 9, 15, 45	**2**	**B1** for 4 or 5 correct factors
5(b)(iv)	Any irrational number between 6 and 7 e.g. $\sqrt{37}$ or 2π	**1**	
6(a)(i)	20	**2**	**M1** for $\frac{4}{12}[\times 60]$
6(a)(ii)	28	**1**	
6(a)(iii)	1528 or 3.28pm	**1**	**FT** 1500 + *their* 28 mins
6(b)(i)	3 : 10	**2**	**M1** for 6 and 20 seen If 0 scored, **SC1** for 10 : 3
6(b)(ii)(a)	Straight lines drawn (1500, 0) to (1520, 2) and (1520, 2) to (1528, 4)	**2**	**B1** for line from (1500, 0) to (1520, 2) **B1FT** for line from (*their* 1520, 2) to (*their* 1520 + 8, 4)
6(b)(ii)(b)	14	**1**	**FT** *their* graph
6(b)(ii)(c)	1.25 to 1.5	**1**	**FT** *their* graph
7(a)	4	**1**	
7(b)(i)	Rotation 90 clockwise oe [centre] (0, –2)	**3**	**B1** for each
7(b)(ii)	Translation $\begin{pmatrix}-4\\2\end{pmatrix}$	**2**	**B1** for each
7(b)(iii)	Enlargement [scale factor] 2 [centre] (–2, –7)	**3**	**B1** for each
7(c)	Correct reflection	**2**	**B1** for a correct reflection in $x = k$ or for 6 or more vertices plotted correctly If 0 scored, **SC1** for correct reflection in $y = -1$

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Question	Answer	Marks	Partial Marks
8(a)(i)	[1:] 1500 000	**2**	**M1** for 15 000 m seen or [15 ×]1000 × 100
8(a)(ii)	96	**2**	**B1** for 6.4 seen or **M1** for *their* 6.4 × 15
8(a)(iii)	117	**1**	
8(a)(iv)	Correct region shaded	**5**	**B2** for 2 correct arcs drawn, centre *Y* with radius 3 cm and 4 cm or **B1** for 3 cm and 4 cm seen or implied by calculation or for one correct arc drawn **B2** for 2 correct lines drawn or **B1** for 1 correct line drawn **B1** depB1B1 for correct region
8(b)	253	**2**	**M1** for 180 + 73 or 360 – 107 or sketch with alternate angles marked or sketch with 73° and correct bearing marked
9(a)	450	**1**	
9(b)	$10p + 3n = 525$	**2**	**M1** for $10p + 3n$
9(c)	for correctly eliminating one variable	**M1**	**FT**
	$[p] = 30$	**A1**	
	$[n] = 75$	**A1**	If 0 scored, **SC1** for 2 values satisfying one of the original equations or **SC1** for both correct but no working
10(a)	Cala, Elu	**2**	**B1** for one correct and no extras or **B1** for two correct and one extra
10(b)(i)	14	**2**	**M1** for $[s =]\sqrt{19.6 \times 10}$
10(b)(ii)	$[h =]\frac{s^2}{19.6}$	**2**	**M1** for $s^2 = 19.6[\times]h$
11(a)(i)(a)	*C*	**1**	
11(a)(i)(b)	*A*	**1**	
11(a)(i)(c)	*D*	**1**	
11(a)(ii)	10	**2**	**M1** for $-26 = -3x + 4$ or better

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Question	Answer	Marks	Partial Marks
11(b)(i)	39, 0, –9	**3**	**B1** for each
11(b)(ii)	Correct smooth curve	**4**	**B3FT** for 8 or 7 correct plots **B2FT** for 5 or 6 correct plots **B1FT** for 3 or 4 correct plots
11(b)(iii)	(j, k) where $4.4 < j < 6$ and $-28 < k < -24$	**1**	

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